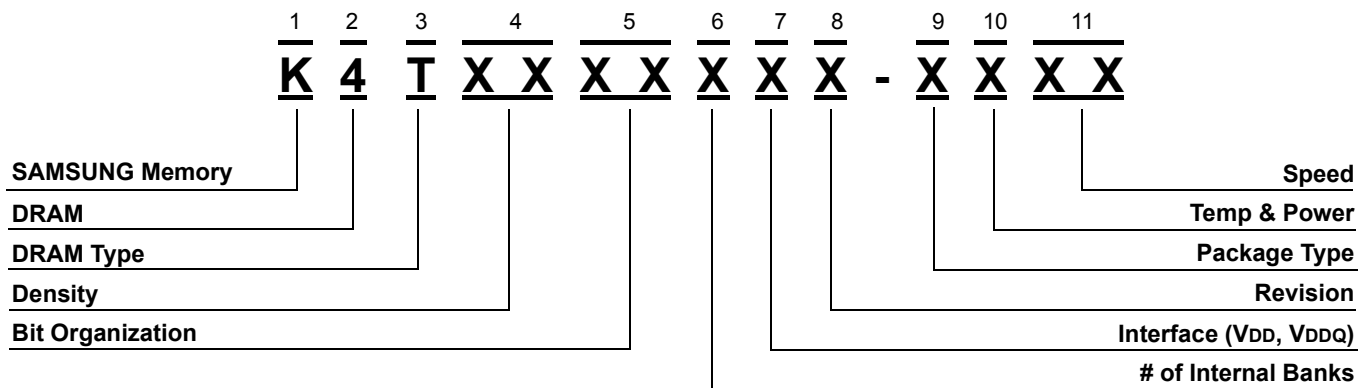


DDR2 SDRAM Product Guide

January 2009

Memory Division

A. DDR2 SDRAM Component Ordering Information



1. SAMSUNG Memory : K

2. DRAM : 4

3. DRAM Type

T : DDR2 SDRAM

4. Density

56 : 256Mb

51 : 512Mb

1G : 1Gb

2G : 2Gb

4G : 4Gb

5. Bit Organization

04 : x 4

06 : x 4 Stack

07 : x 8 Stack

08 : x 8

16 : x16

26 : x 4 Stack (JEDEC Standard)

27 : x 8 Stack (JEDEC Standard)

6. # of Internal Banks

3 : 4 Banks

4 : 8 Banks

7. Interface (VDD, VDDQ)

Q : SSTL-1.8V (1.8V, 1.8V)

8. Revision

M : 1st Gen.

A : 2nd Gen.

B : 3rd Gen.

C : 4th Gen.

D : 5th Gen.

E : 6th Gen.

F : 7th Gen.

G : 8th Gen.

H : 9th Gen.

Q : 17th Gen.

R : 18th Gen.

9. Package Type

Z : FBGA (Lead-free)

J : FBGA DDP (Lead-free)

H : FBGA (Lead-free & Halogen-free)

M : FBGA DDP (Lead-free & Halogen-free)

T : FBGA DSP (Lead-free & Halogen-free, Thin)

10. Temp & Power

C : Commercial Temp.(0°C ~ 95°C) & Normal Power

L : Commercial Temp.(0°C ~ 95°C) & Low Power

Y : Commercial Temp.(0°C ~ 95°C) & Low Voltage

11. Speed

CC : DDR2-400 (200MHz @ CL=3, tRCD=3, tRP=3)

D5 : DDR2-533 (266MHz @ CL=4, tRCD=4, tRP=4)

E6 : DDR2-667 (333MHz @ CL=5, tRCD=5, tRP=5)

F7 : DDR2-800 (400MHz @ CL=6, tRCD=6, tRP=6)

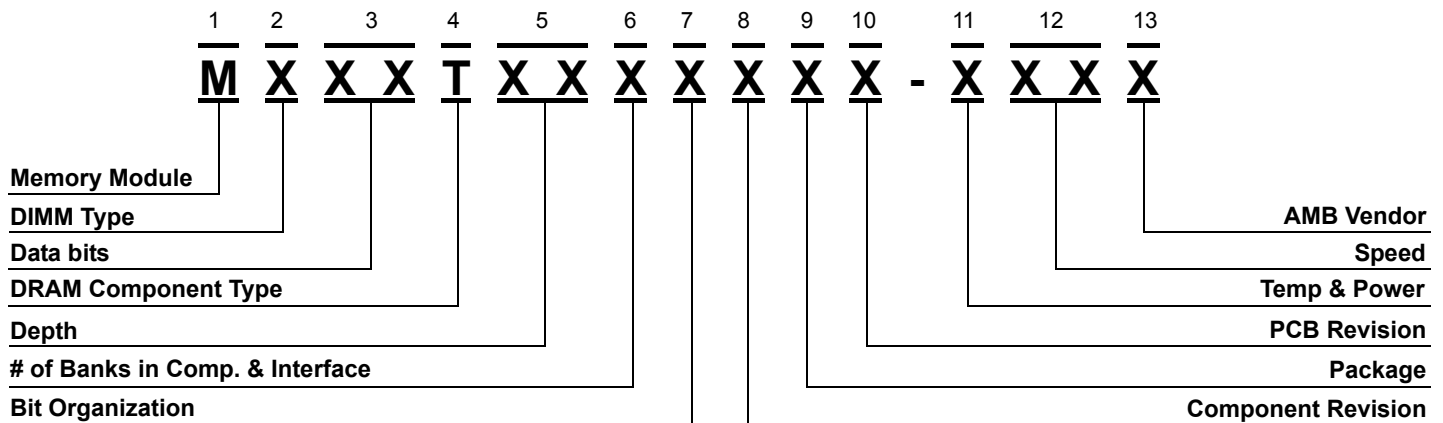
E7 : DDR2-800 (400MHz @ CL=5, tRCD=5, tRP=5)

F8 : DDR2-1066(533MHz @ CL=7, tRCD=7, tRP=7)

B. DDR2 SDRAM Component Product Guide

Density	Banks	Part Number	Package & Power, Temp. (-C/-L) & Speed	Org.	PKG	Avail.
512Mb G-die	4Banks	K4T51043QG	HC(L)E7/F7/E6	128M x 4	60 ball FBGA	Now
		K4T51083QG	HC(L)E7/F7/E6	64M x 8		
		K4T51163QG	HC(L)E7/F7/E6	32M x 16	84 ball FBGA	
1Gb Q-die	8Banks	K4T1G044QQ	HC(L)E7/F7/E6	256M x 4	60 ball FBGA	Now
		K4T1G084QQ	HC(L)E7/F7/E6	128M x 8		
		K4T1G164QQ	HC(L)E7/F7/E6	64M x 16	84 ball FBGA	
1Gb E-die	8Banks	K4T1G044QE	HC(L)E7/F7/E6	256M x 4	60 ball FBGA	Now
		K4T1G084QE	HC(L)E7/F7/E6	128M x 8		
		K4T1G164QE	HC(L)E7/F7/E6	64M x 16	84 ball FBGA	Now
		K4T1G164QE	HC(L)F8			Feb.'09
2Gb A-die	8Banks	K4T2G044QA	HC(L)F7/E6	512M x 4	68 ball FBGA	Now
		K4T2G084QA	HC(L)F7/E6	256M x 8		

C. DDR2 SDRAM Module Ordering Information



1. Memory Module : M

2. DIMM Type

3 : DIMM
4 : SODIMM

3. Data Bits

78 : x64 240pin Unbuffered DIMM
91 : x72 240pin ECC unbuffered DIMM
92 : x72 240pin VLP Registered DIMM
93 : x72 240pin Registered DIMM
95 : x72 240pin Fully Buffered DIMM
70 : x64 200pin Unbuffered SODIMM

4. DRAM Component Type

T : DDR2 SDRAM (1.8V VDD)

5. Depth

32 : 32M 33 : 32M (for 128Mb/512Mb)
64 : 64M 65 : 64M (for 128Mb/512Mb)
28 : 128M 29 : 128M (for 128Mb/512Mb)
56 : 256M 57 : 256M (for 512Mb/2Gb)
51 : 512M 52 : 512M (for 512Mb/2Gb)
1G : 1G 1K : 1G (for 2Gb)

6. # of Banks in comp. & Interface

5 : 4Banks & SSTL-1.8V
6 : 8Banks & SSTL-1.8V

7. Bit Organization

0 : x 4
3 : x 8
4 : x16
6 : x 4 Stack (JEDEC Standard)
7 : x 8 Stack (JEDEC Standard)
8 : x 4 Stack
9 : x 8 Stack

8. Component Revision

M : 1st Gen. A : 2nd Gen.
B : 3rd Gen. C : 4th Gen.
D : 5th Gen. E : 6th Gen.
F : 7th Gen. G : 8th Gen.
Q : 17th Gen. R : 18th Gen.

9. Package

Z : FBGA(Lead-free)
J : FBGA DDP (Lead-free)
Q : FBGA QDP (Lead-free)
H : FBGA (Lead-free & Halogen-free)
M : FBGA DDP (Lead-free & Halogen-free)
E : FBGA QDP (Lead-free & Halogen-free)

10. PCB Revision

0 : Mother PCB 1 : 1st Rev.
2 : 2nd Rev. 3 : 3rd Rev.
4 : 4th Rev. A : Parity DIMM
S : Reduced PCB

11. Temp & Power

C : Commercial Temp.(0°C ~ 95°C) & Normal Power
L : Commercial Temp.(0°C ~ 95°C) & Low Power
Y : Commercial Temp.(0°C ~ 95°C) & Low Voltage

12. Speed

CC : DDR2-400 (200MHz @ CL=3, tRCD=3, tRP=3)
D5 : DDR2-533 (266MHz @ CL=4, tRCD=4, tRP=4)
E6 : DDR2-667 (333MHz @ CL=5, tRCD=5, tRP=5)
F7 : DDR2-800 (400MHz @ CL=6, tRCD=6, tRP=6)
E7 : DDR2-800 (400MHz @ CL=5, tRCD=5, tRP=5)
F8 : DDR2-1066(533MHz @ CL=7, tRCD=7, tRP=7)

13. AMB Vendor For FBDIMM

5 : Intel
6, 8 : IDT
3, 4, 9 : Montage

Note : PC2-8500(DDR2-1066). PC2-6400(DDR2-800), PC2-5300(DDR2-667)
PC2-4200(DDR2-533), PC2-3200(DDR2-400)

D. DDR2 SDRAM Module Product Guide

240Pin DDR2 Unbuffered DIMM										
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.
64Mx 64	512MB	M378T6553GZS	CE7/F7/E6	64M x 8 * 8pcs	512Mb G-die	4	1	60 ball FBGA	30mm	Now
		M378T6464QZ(H)3	CE7/F7/E6	64M x 16 * 4pcs	1Gb Q-die	8	1	84 ball FBGA		
		M378T6464EHS	CE7/F7/E6	64M x 16 * 4pcs	1Gb E-die		1			
64Mx 72		M391T6553GZ3	CE7/F7/E6	64M x 8 * 9pcs	512Mb G-die	4	1	60 ball FBGA		
128Mx 64	1GB	M378T2953GZ3	CE7/F7/E6	64M x 8 * 16pcs	512Mb G-die	4	2	60 ball FBGA	30mm	Now
		M378T2863QZ(H)S	CE7/F7/E6	128M x 8 * 8pcs	1Gb Q-die	8	1			Feb. '09
		M378T2863EHS	CE7/F7/E6		1Gb E-die					
		M378T2863EHS	CF8							
128Mx 72		M391T2953GZ3	CE7/F7/E6	64M x 8 * 18pcs	512Mb G-die	4	2	60 ball FBGA	30mm	Now
		M391T2863QZ(H)3	CE7/F7/E6	128M x 8 * 18pcs	1Gb Q-die	8	1			
		M391T2863EH3	CE7/F7/E6		1Gb E-die					
256Mx 64	2GB	M378T5663QZ(H)3	CE7/F7/E6	128M x 8 * 16pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now
		M378T5663EH3	CE7/F7/E6		1Gb E-die					Feb. '09
		M378T5663EH3	CF8							
256Mx 72		M391T5663QZ(H)3	CE7/F7/E6	128M x 8 * 18pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now
		M391T5663EH3	CE7/F7/E6		1Gb E-die					
512Mx 64	4GB	M378T5263AZ(H)3	CF7/E6	256M x 8 * 16pcs	2Gb A-die	8	2	68 ball FBGA	30mm	Now
512Mx 72		M391T5263AZ(H)3	CF7/E6	256M x 8 * 18pcs	2Gb A-die					

200Pin DDR2 SODIMM											
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.	
64Mx 64	512MB	M470T6554GZ3	C(L)E7/F7/E6	32M x 16 * 8pcs	512Mb G-die	4	2	84 ball FBGA	30mm	Now	
		M470T6464QZ(H)3	C(L)E7/F7/E6	64M x 16 * 4pcs	1Gb Q-die	8	1				
		M470T6464EHS	C(L)E7/F7/E6		1Gb E-die						
128Mx 64	1GB	M470T2953GZ3	C(L)E7/F7/E6	64M x 8 * 16pcs	512Mb G-die	4	2	60 ball FBGA	30mm	Now	
		M470T2864QZ(H)3	C(L)E7/F7/E6	64M x 16 * 8pcs	1Gb Q-die	8	2	84 ball FBGA			
		M470T2864EH3	C(L)E7/F7/E6		1Gb E-die			1			
		M470T2863EH3	C(L)E7/F7/E6	128M x 8 * 8pcs							
256Mx 64	2GB	M470T5663QZ(H)3	C(L)E7/F7/E6	128M x 8 * 16pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now	
		M470T5663EH3	C(L)E7/F7/E6		1Gb E-die						
512Mx 64	4GB	M470T5267AZ(H)3	C(L)F7/E6	st.512M x 8 * 8pcs	2Gb A-die	8	2	83 ball FBGA	30mm	Now	

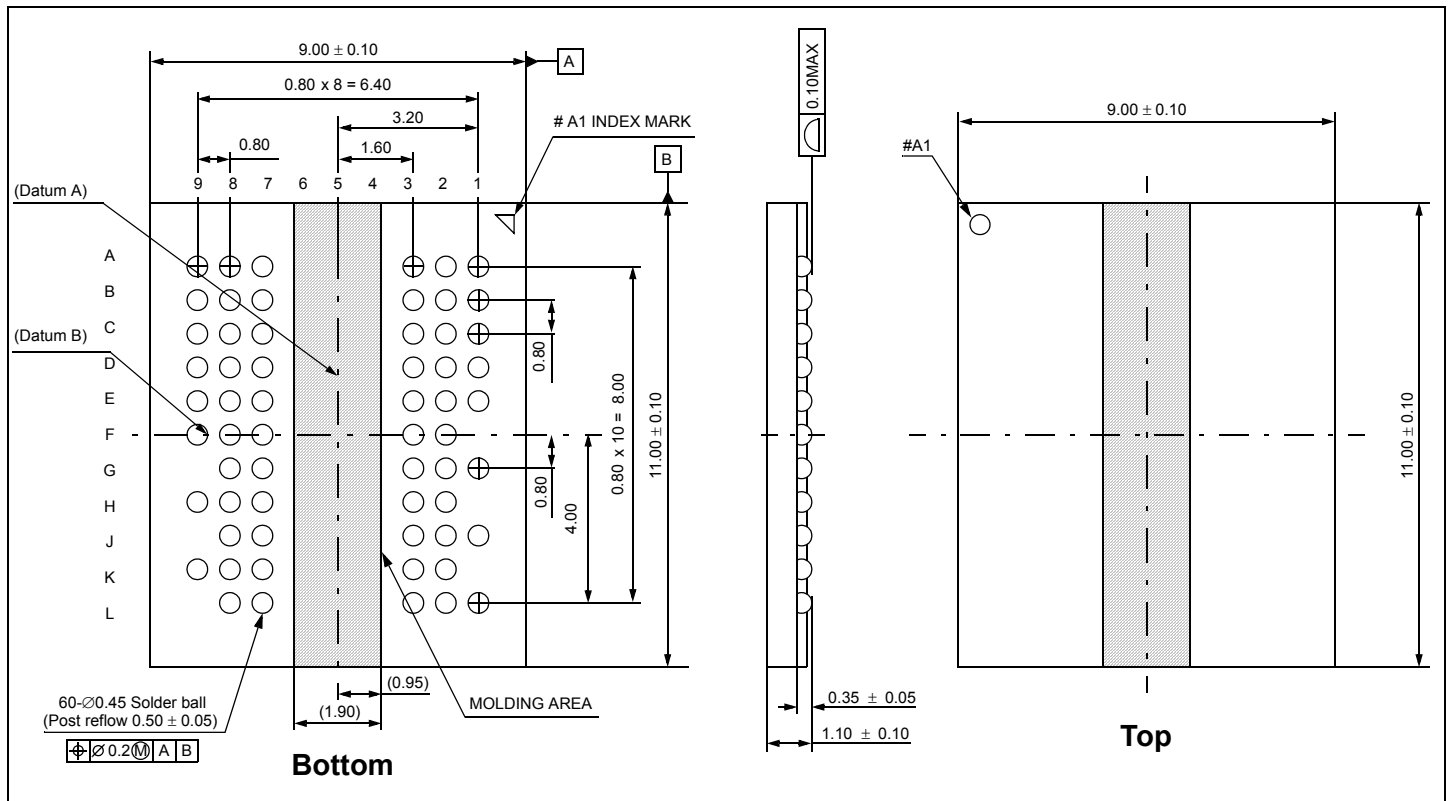
240Pin DDR2 Registered DIMM										
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.
64Mx 72	512MB	M393T6553GZ3	CD5/CC	64M x 8 * 9pcs	512Mb G-die	4	1	60 ball FBGA	30mm	Now
		M393T6553GZA	CF7/E6							
128Mx 72	1GB	M393T2953GZ3	CD5/CC	64M x 8 * 18pcs	512Mb G-die	4	2	60 ball FBGA	30mm	Now
		M393T2953GZA	CF7/E6							
		M393T2950GZ3	CD5/CC	128M x 4 * 18pcs			1			
		M393T2950GZA	CF7/E6							
		M393T2863QZ3	CD5/CC	128M x 8 * 9pcs	1Gb Q-die	8	1			
		M393T2863QZA	CE7/F7/E6							
		M393T2863QHA	CE6/F7/E7							
										2Q. '09
256Mx 72	2GB	M393T5750GZ3	CD5/CC	128M x 4 * 36pcs	512Mb G-die	4	2	60 ball FBGA	30mm	Now
		M393T5750GZA	CF7/E6							
		M393T5663QZ3	CD5/CC	128M x 8 * 18pcs	1Gb Q-die	8	2			2Q. '09
		M393T5663QZA	CF7/E6							
		M393T5663QHA	CE6/F7/E7	256M x 4 * 18pcs			1			Now
		M393T5660QZ3	CD5/CC							
		M393T5660QZA	CE7/F7/E6							
		M393T5660QHA	CE6/F7/E7							
512Mx 72	4GB	M393T5160QZ3	CD5/CC	256M x 4 * 36pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now
		M393T5160QZA	CE7/F7/E6							
		M393T5160QHA	CE6/F7/E7				512M x 4 * 18pcs			2Gb A-die
		M393T5260AZA	CF7/E6							
1Gx 72	8GB	M393T1G60QJA	CE6/D5	DDP 512M x 4 * 36pcs	1Gb Q-die	8	4	63 ball FBGA	30mm	Now
		M393T1G60QMA	CE6/D5							
		M393T1K66AZA	CF7/E6	st.1G x 4 * 18pcs	2Gb A-die		2	83 ball FBGA		Now

240Pin DDR2 VLP Registered DIMM										
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.
64Mx 72	512MB	M392T6553GZA	CF7/E6	64M x 8 * 9pcs	512Mb G-die	4	1	60 ball FBGA	18.3mm	Now
128Mx 72	1GB	M392T2950GZA	CF7/E6	128M x 4 * 18pcs	512Mb G-die	4	1	60 ball FBGA	18.3mm	Now
		M392T2863QZA	CF7/E6	128M x 8 * 9pcs	1Gb Q-die	8	1			2Q. '09
		M392T2863QHA	CF7/E6							
256Mx 72	2GB	M392T5660QZA	CF7/E6	256M x 4 * 18pcs	1Gb Q-die	8	1	60 ball FBGA	18.3mm	Now
		M392T5660QHA	CF7/E6				2			2Q. '09
		M392T5663QZA	CF7/E6	128M x 8 * 18pcs						Now
		M392T5663QHA	CF7/E6							2Q. '09
512Mx 72	4GB	M392T5160QJA	CF7/E6	DDP 512M x 4 * 18pcs	1Gb Q-die	8	2	63 ball FBGA	18.3mm	Now
		M392T5160QMA	CF7/E6							2Q. '09
1Gx 72	8GB	M392T1G60QQA	CE6/D5	QDP 1G x 4 * 18pcs	1Gb Q-die	8	4	65 ball FBGA	18.3mm	Now
		M392T1G60QEA	CE6/D5	QDP 1G x 4 * 18pcs						2Q. '09

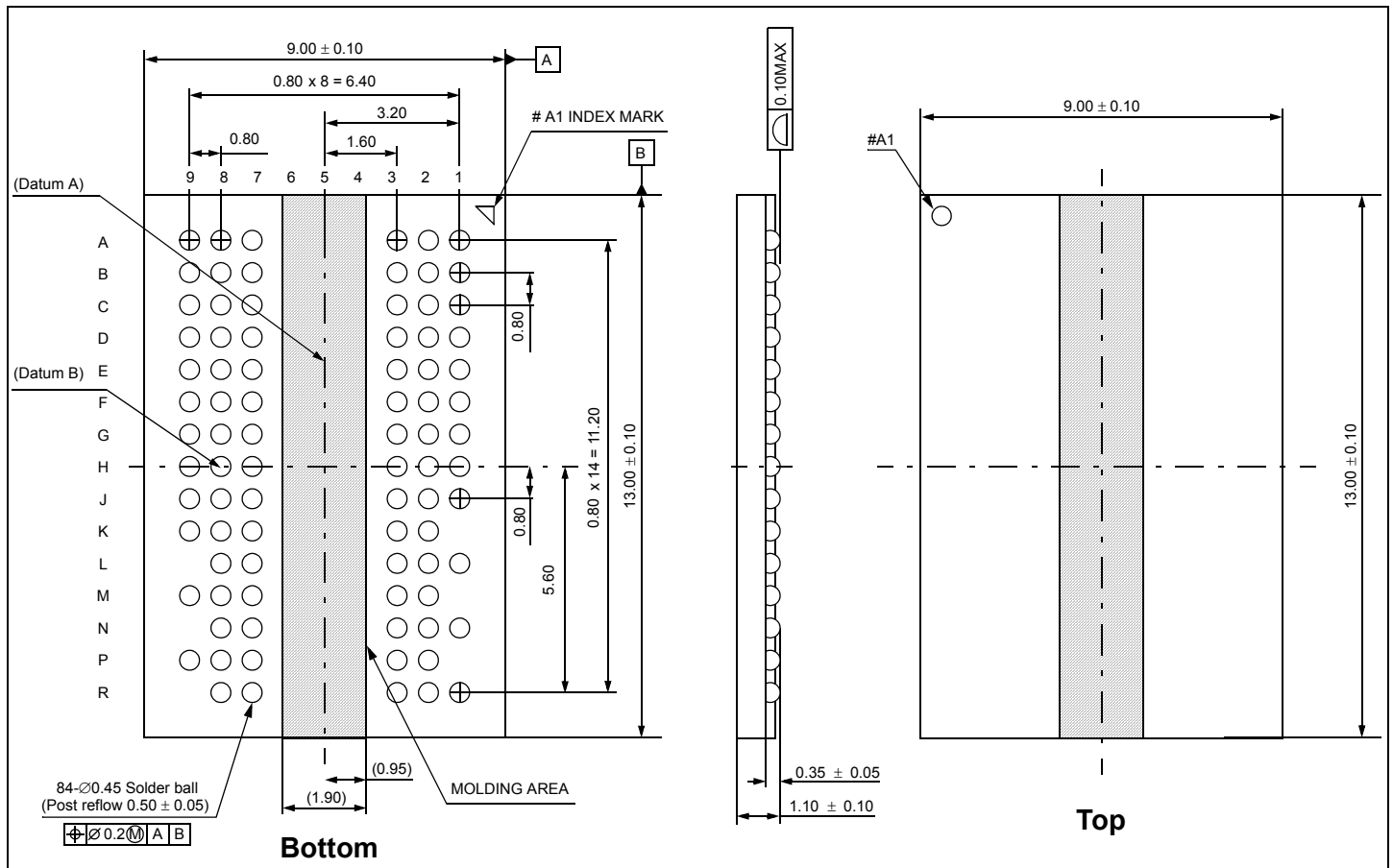
240Pin DDR2 Fully Buffered DIMM(1.8V)																																	
Org.	Density	Part Number	Speed	AMB	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.																						
64Mx 72	512MB	M395T6553GZ4	CE7/F7/E6 CE6	6 : IDT C1 5 : Intel D1	64M x 8 * 9pcs	512Mb G-die	4	1	60 ball FBGA	30.35mm	Now																						
128Mx 72	1GB	M395T2953GZ4	CE7/F7/E6 CE6	6 : IDT C1 5 : Intel D1	64M x 8 * 18pcs	512Mb G-die	4	2	60 ball FBGA	30.35mm	Now																						
			M395T2863QZ4	CE7/F7/E6 CE7/F7/E6 CE6	6 : IDT C1 8: IDT L4 5 : Intel D1 9: Montage D1	128M x 8 * 9pcs	1Gb Q-die	8				1																					
		M395T2863QH4		CE7/F7/E6 CE7/F7/E6 CE6	6 : IDT C1 8: IDT L4 5 : Intel D1 9: Montage D1																												
				M395T5750GZ4	CE7/F7/E6 CE6								6 : IDT C1 5 : Intel D1	128M x 4 * 36pcs	512Mb G-die	4	2	60 ball FBGA	30.35mm	Now													
					M395T5663QZ4								CE7/F7/E6 CE7/F7/E6 CE6	6 : IDT C1 8: IDT L4 5 : Intel D1 9: Montage D1	128M x 8 * 18pcs	1Gb Q-die	8				2												
			M395T5663QH4	CE7/F7/E6 CE7/F7/E6 CE6									6 : IDT C1 8: IDT L4 5 : Intel D1 9: Montage D1																				
				512Mx 72							4GB		M395T5160QZ4	CE7/F7/E6 CE6 CE6								6 : IDT C1 8: IDT L4 5 : Intel D1 9: Montage D1	256M x 4 * 36pcs	1Gb Q-die	8	2	60 ball FBGA	30.35mm	Now				
														M395T5160QH4								CE7/F7/E6 CE6 CE6								6 : IDT C1 8: IDT L4 5 : Intel D1 9: Montage D1			
		M395T5163QZ4			CE7/F7/E6																	8: IDT L4							128M x 8 * 36pcs			4	
		M395T5163QH4			CE7/F7/E6																												
M395T5263AZ4	CF7/E6 CF7/E6	6 : IDT C1 8: IDT L4			256M x 8 * 18pcs				2Gb A-die				2							68 ball FBGA		Now											
	1Gx 72	8GB	M395T1G60QJ4			CE6/F7	8: IDT L4	DDP 512M x 4 * 36pcs				1Gb Q-die														8			4	63 ball FBGA	30.35mm	Now	
			M395T1G60QM4			CF7/E6	8: IDT L4																										
	M395T1K66AZ4	CF7/E6/D5 CF7/E6	6 : IDT C1 8: IDT L4			st.1G x 4 * 18pcs	2Gb A-die					2		83 ball FBGA				Now															

240Pin DDR2 Fully Buffered DIMM(1.55V)											
Org.	Density	Part Number	Speed	AMB	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.
128Mx 72	1GB	M395T2863QZ4	YE6	8: IDT L4	64M x 8 * 18pcs	1Gb Q-die	8	1	60 ball FBGA	30.35mm	Now
		M395T2863QH4	YE6	8: IDT L4							2Q. '09
256Mx 72	2GB	M395T5663QZ4	YE6	8: IDT L4	128M x 8 * 18pcs	1Gb Q-die	8	2	60 ball FBGA	30.35mm	Now
		M395T5663QH4	YE6	8: IDT L4							2Q. '09
512Mx 72	4GB	M395T5160QZ4	YE6	8: IDT L4	256M x 4 * 36pcs	1Gb Q-die	8	2	60 ball FBGA	30.35mm	Now
		M395T5160QH4	YE6	8: IDT L4							2Q. '09
		M395T5163QZ4	YE6	8: IDT L4	128M x 8 * 36pcs			4			Now
		M395T5163QH4	YE6	8: IDT L4		2Q. '09					
		M395T5263AZ4	YE6	8: IDT L4	256M x 8 * 18pcs	2Gb A-die		2	68 ball FBGA		Now
1Gx 72	8GB	M395T1K66AZ4	YE6	8: IDT L4	st.1G x 4 * 18pcs	2Gb A-die	8	2	83 ball FBGA	30.35mm	Now

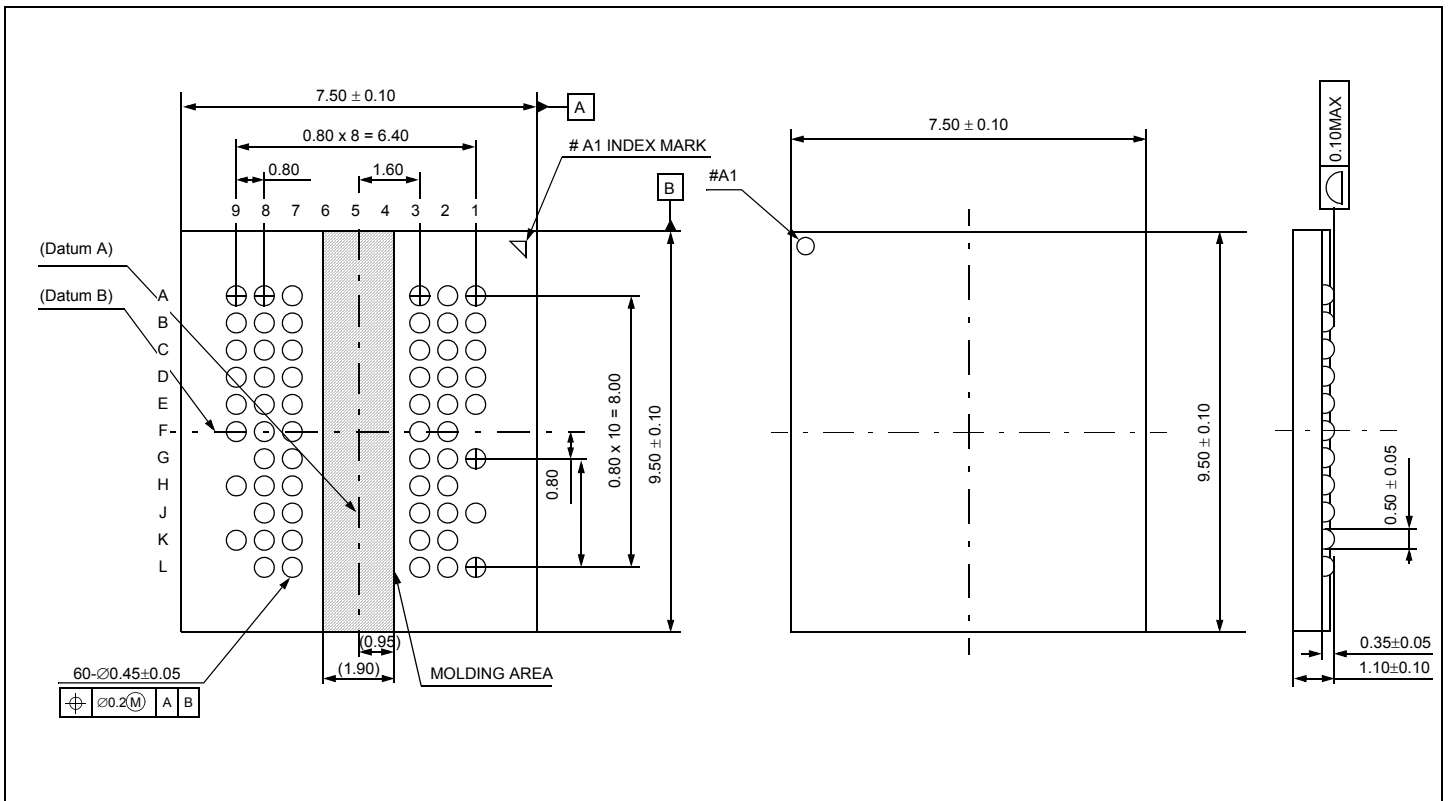
60Ball FBGA for 512Mb E-die (x4/x8)



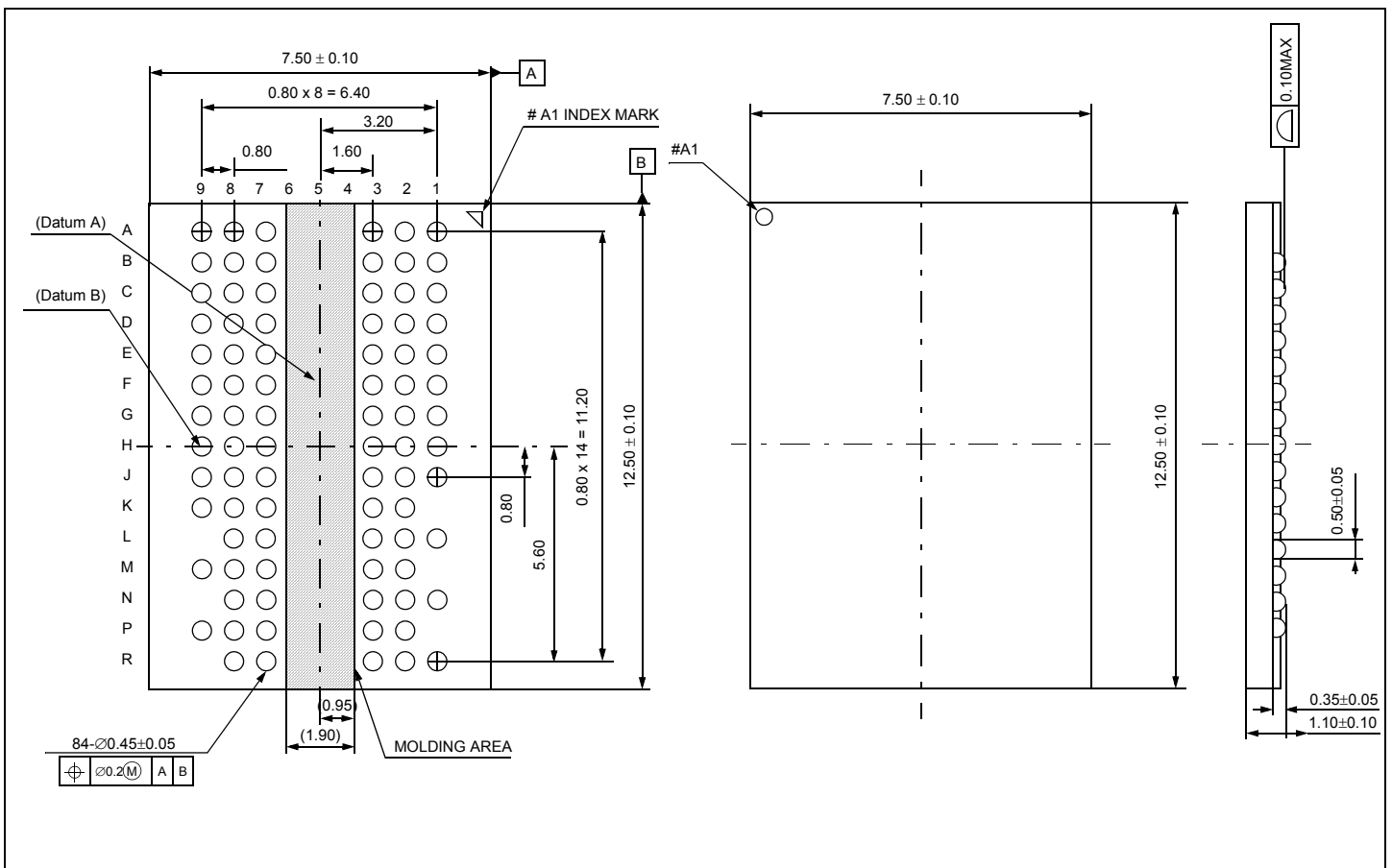
84Ball FBGA for 512Mb E-die (x16)



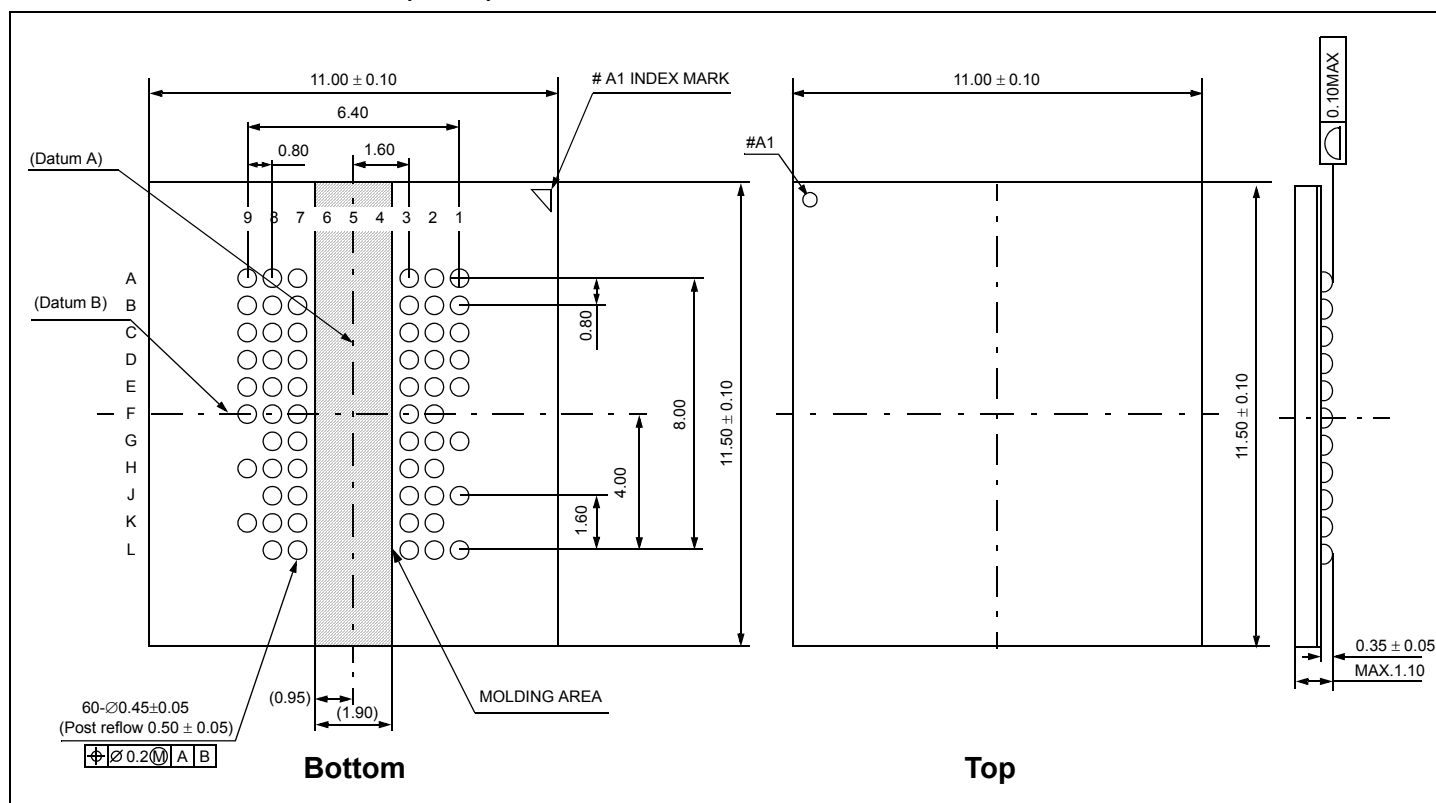
60Ball FBGA for 512Mb G-die (x4/x8)



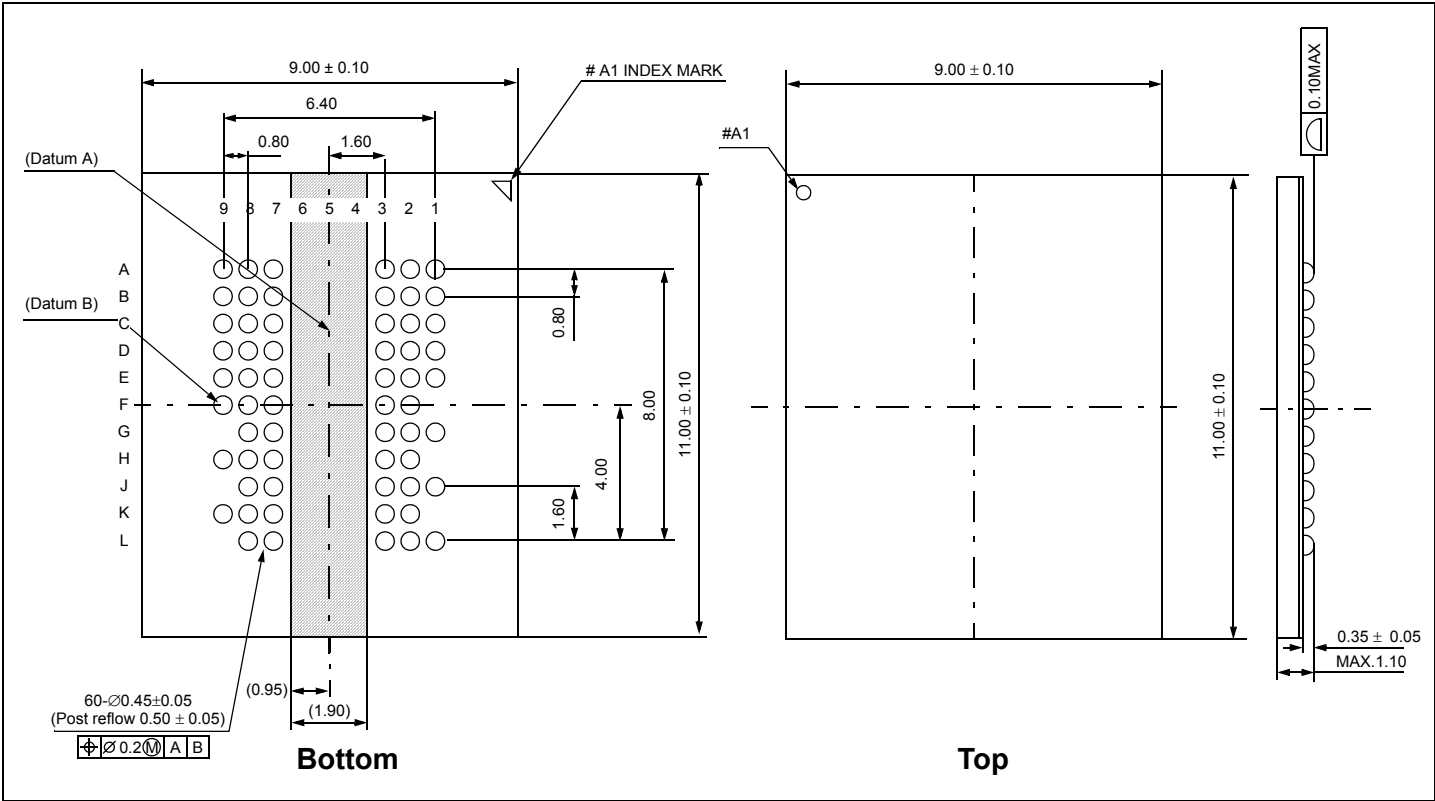
84Ball FBGA for 512Mb G-die (x16)



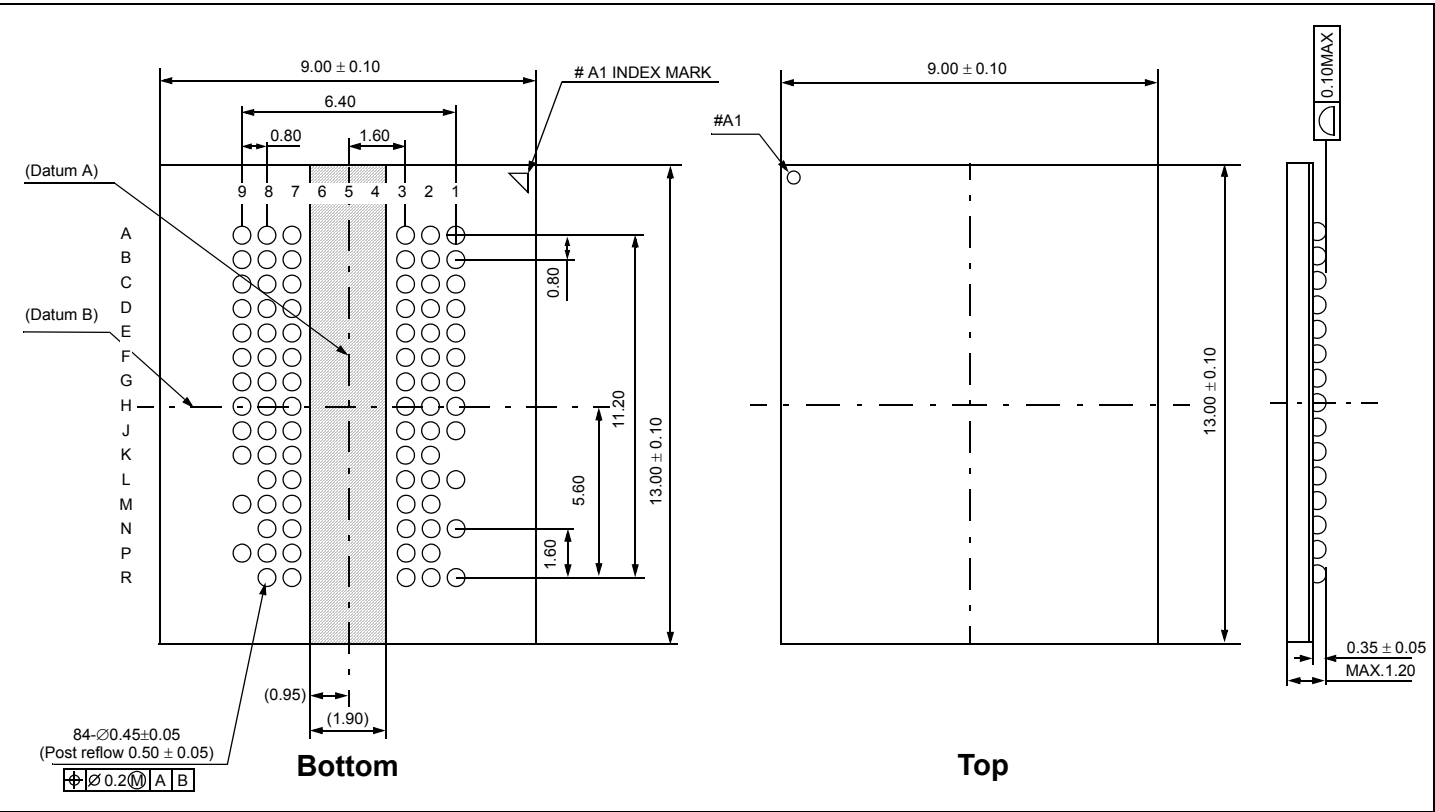
60Ball FBGA for 1Gb C-die (x4/x8)



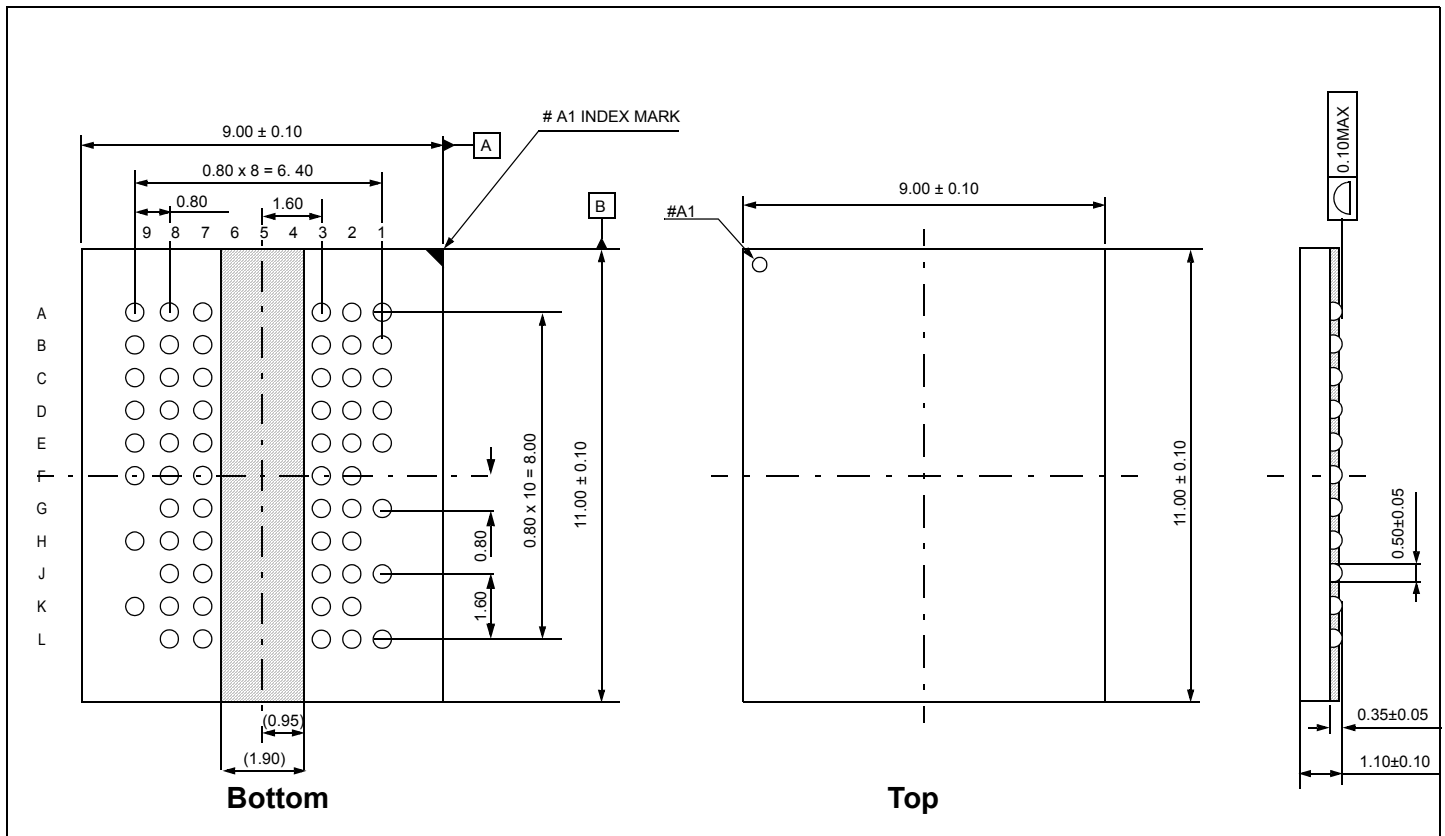
60Ball FBGA for 1Gb D-die (x8)



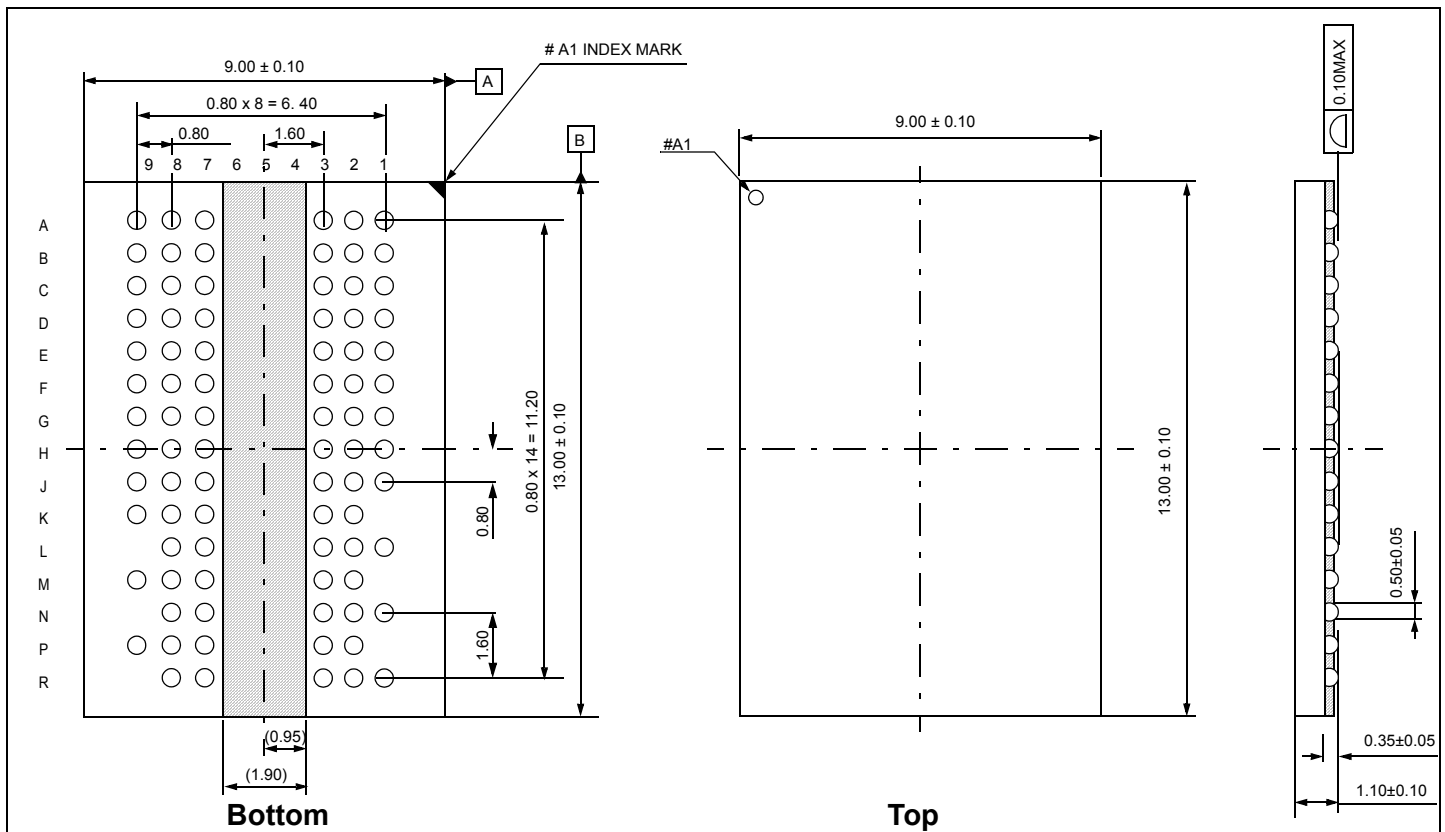
84Ball FBGA for 1Gb D-die (x16)



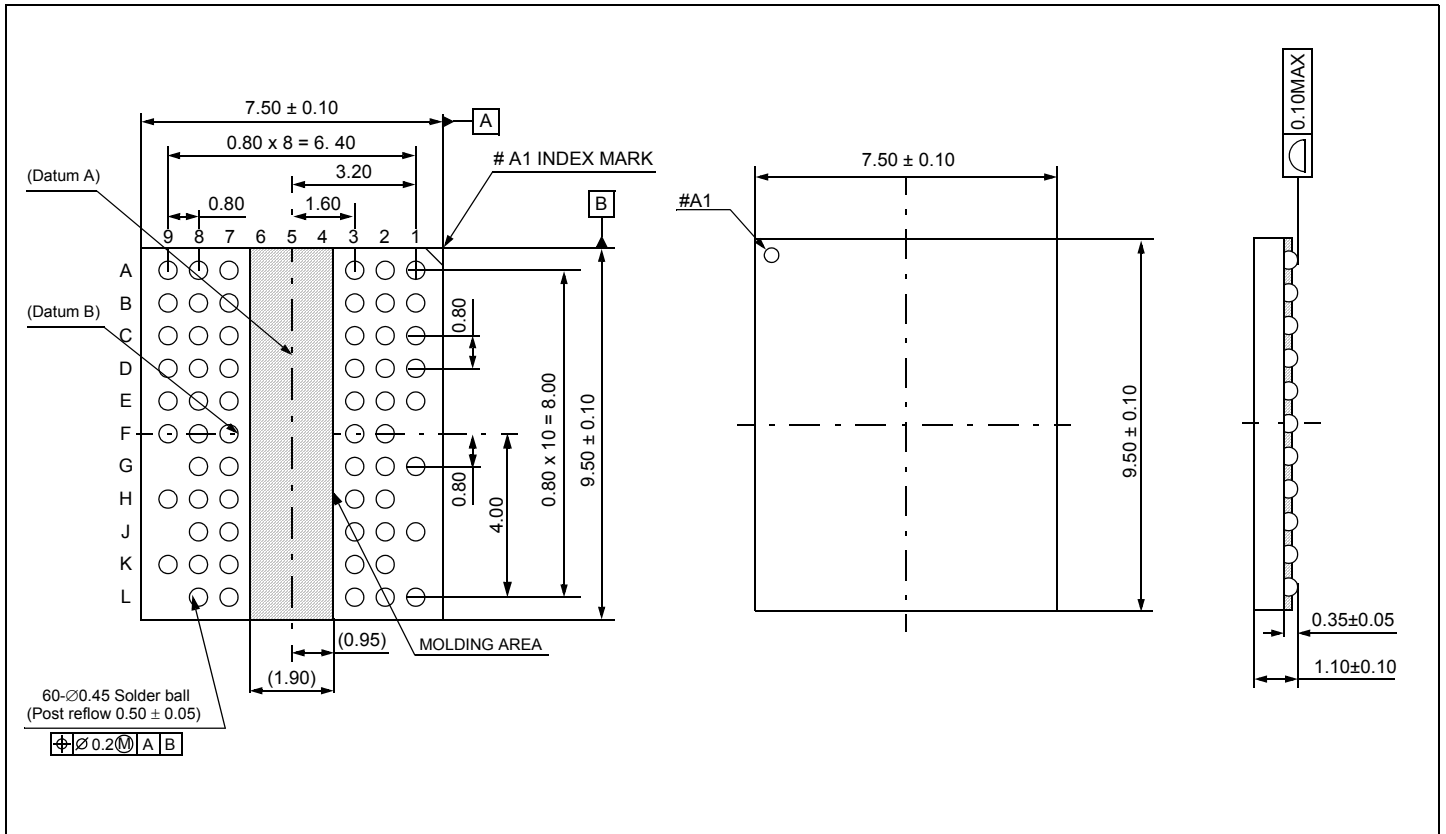
60Ball FBGA for 1Gb Q-die (x4/x8)



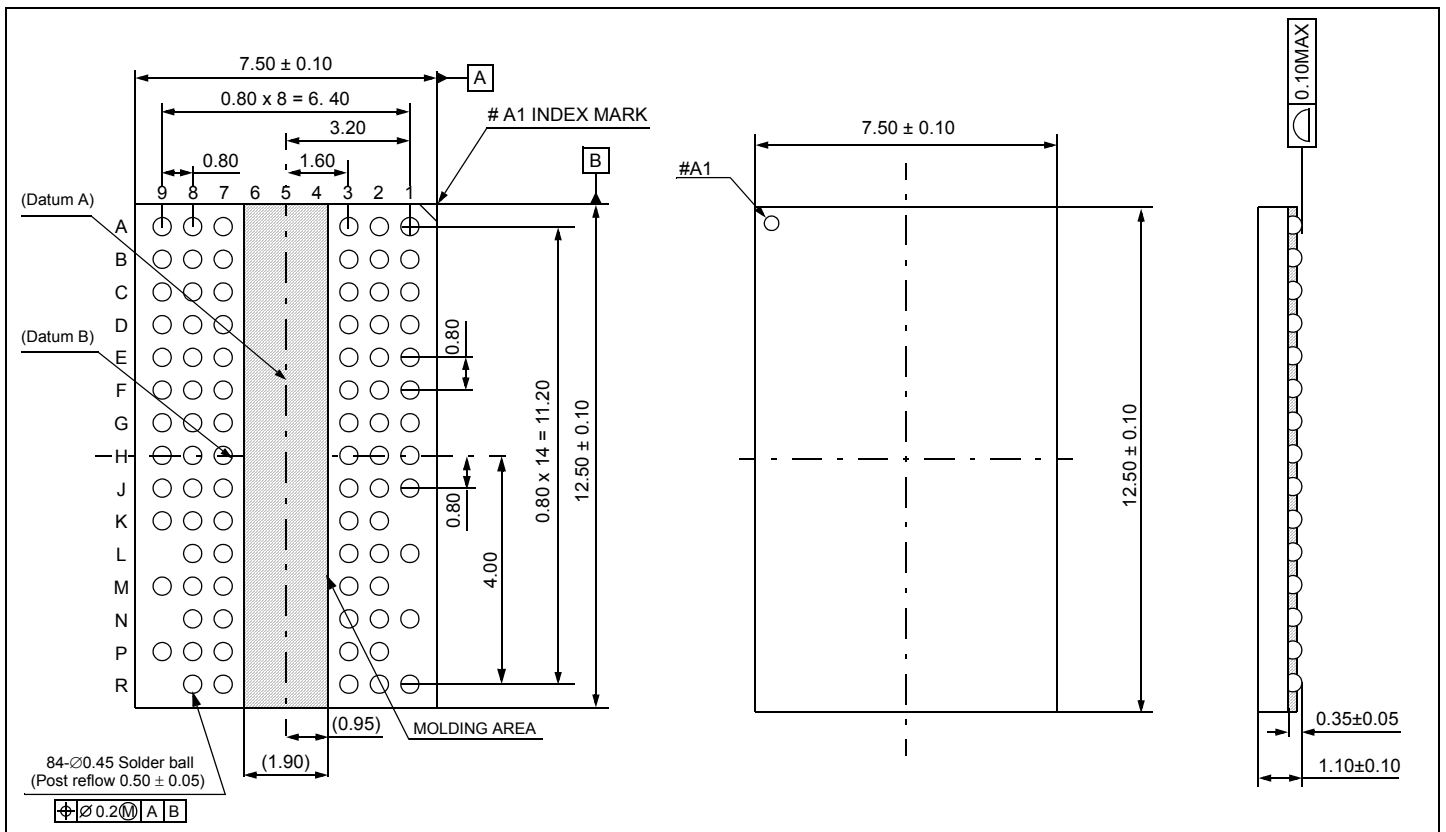
84Ball FBGA for 1Gb Q-die (x16)



60Ball FBGA for 1Gb E-die (x4/x8)



84Ball FBGA for 1Gb E-die (x16)



68Ball FBGA for 2Gb A-die (x4/x8)

